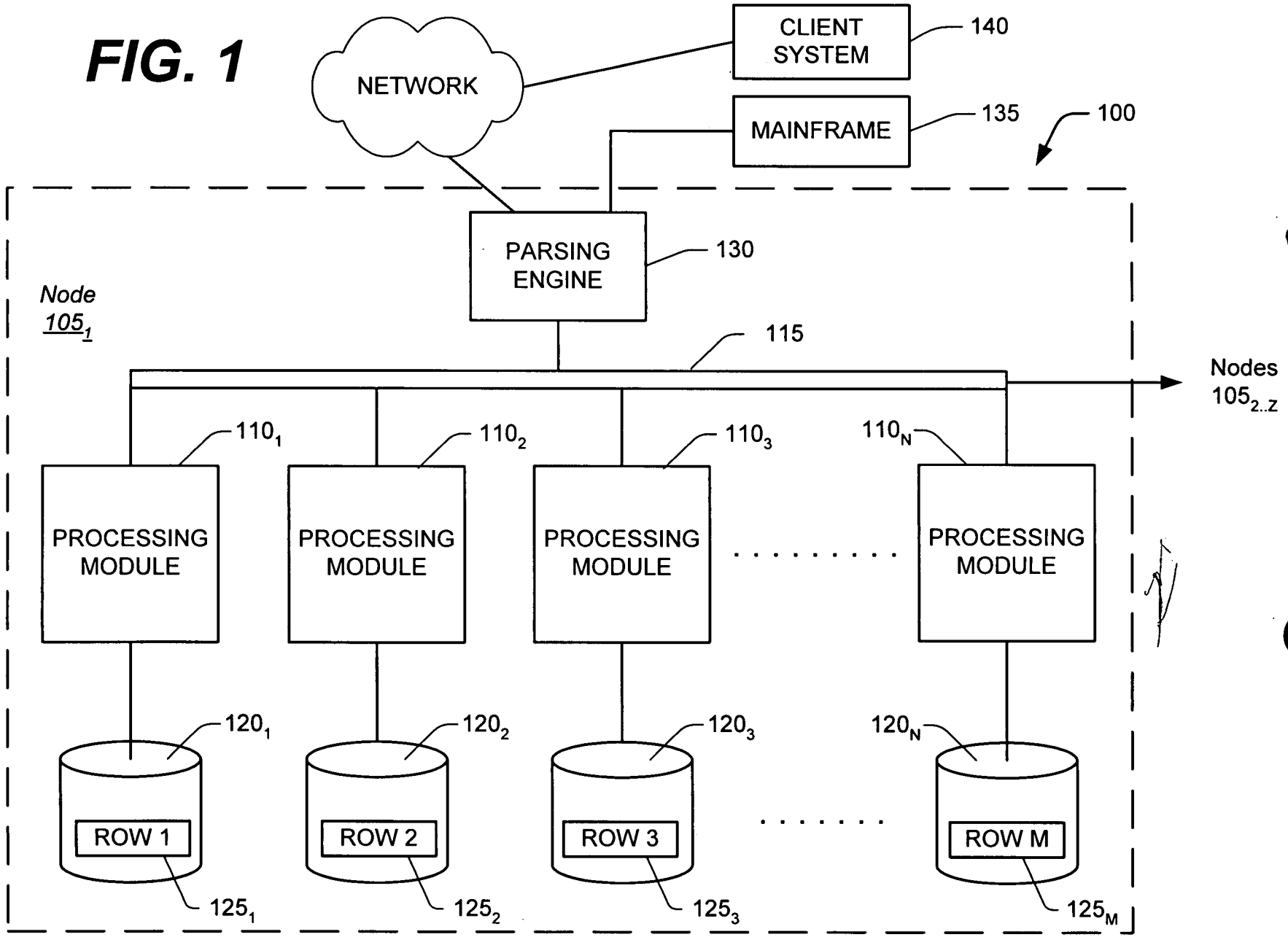
Express Mail #EL477931851US
Filed: 12/07/01; NCR Nos. 10031 & 10033
Inventor: Paul L. Sinclair, et al.
For: Reorganization of Database Records ...
Contact: John D. Cowart/858-485-4903
Sheet 1 of 12

FIG. 1



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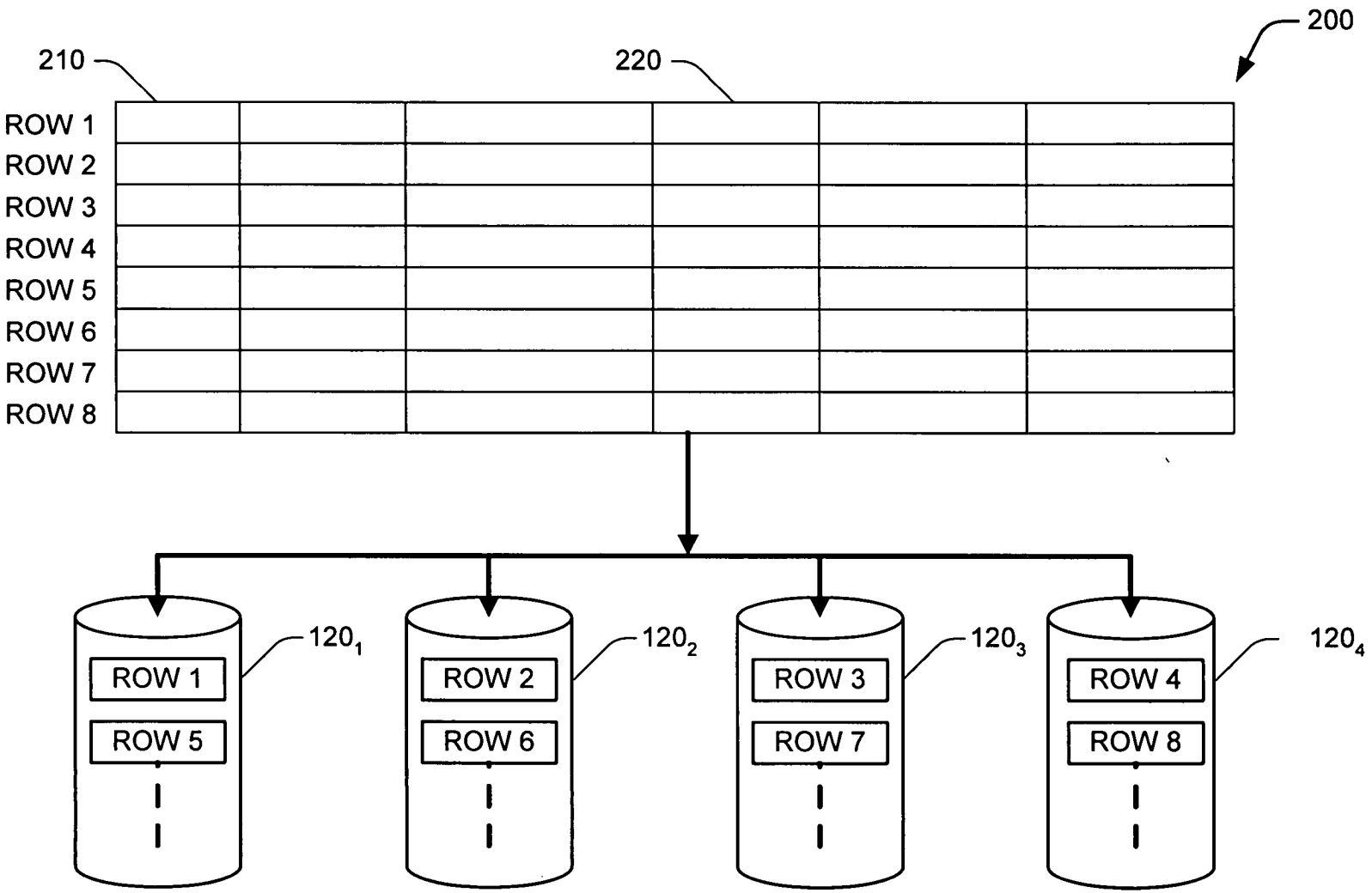

FIG. 2

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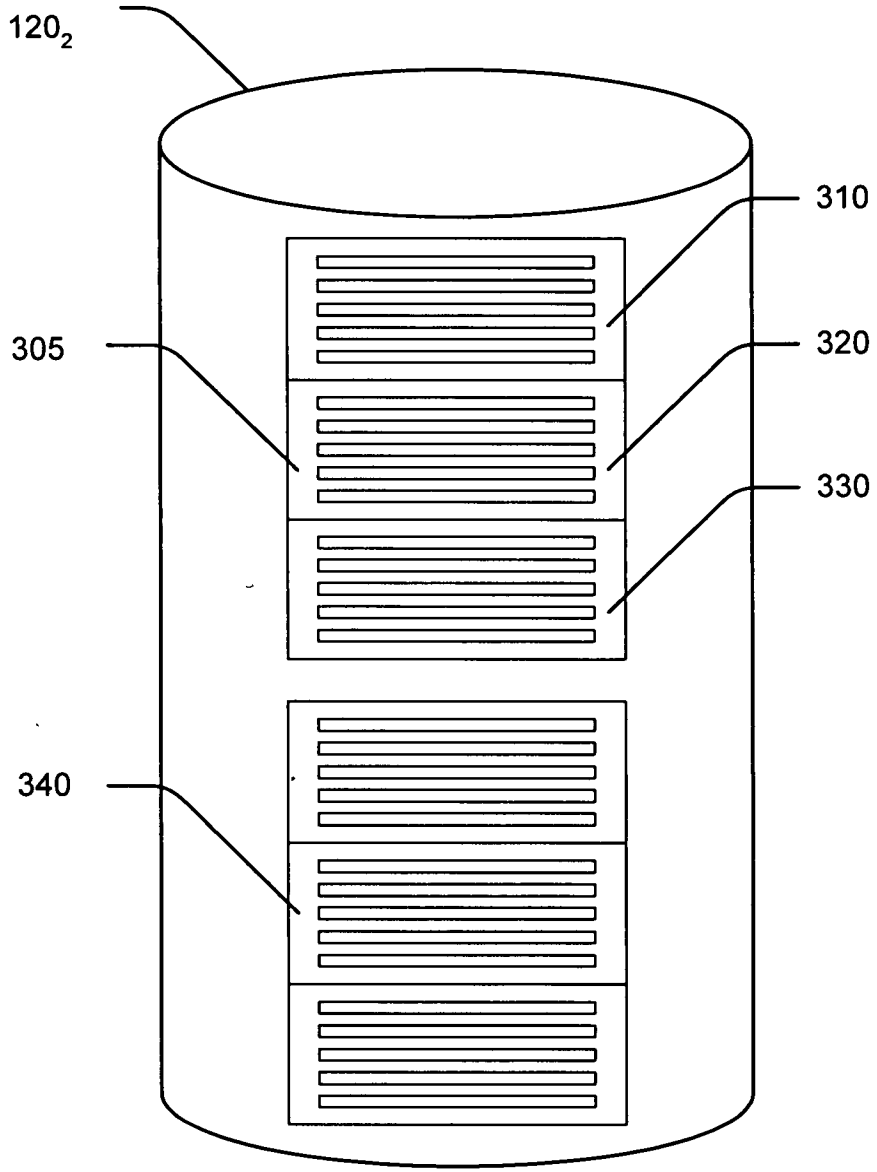

FIG. 3

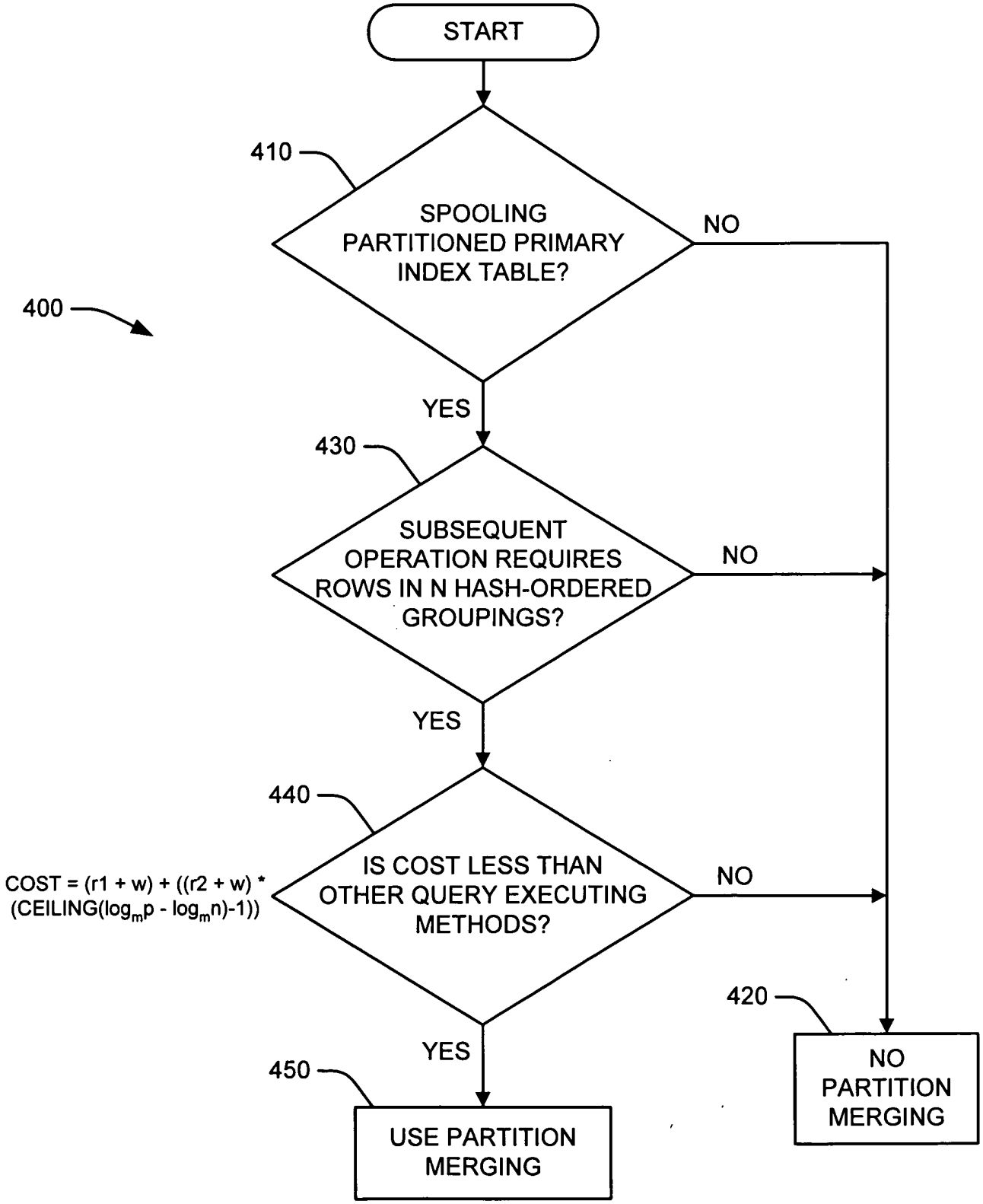
START
410
SPOOLING PARTITIONED PRIMARY INDEX TABLE?
NO
400
YES
430
SUBSEQUENT OPERATION REQUIRES ROWS IN N HASH-ORDERED GROUPINGS?
NO
YES
440
IS COST LESS THAN OTHER QUERY EXECUTING METHODS?
NO
COST = (r1 + w) + ((r2 + w) * (CEILING($\log_m p$ - $\log_m n$)-1))
YES
450
USE PARTITION MERGING
420
NO PARTITION MERGING

FIG. 4

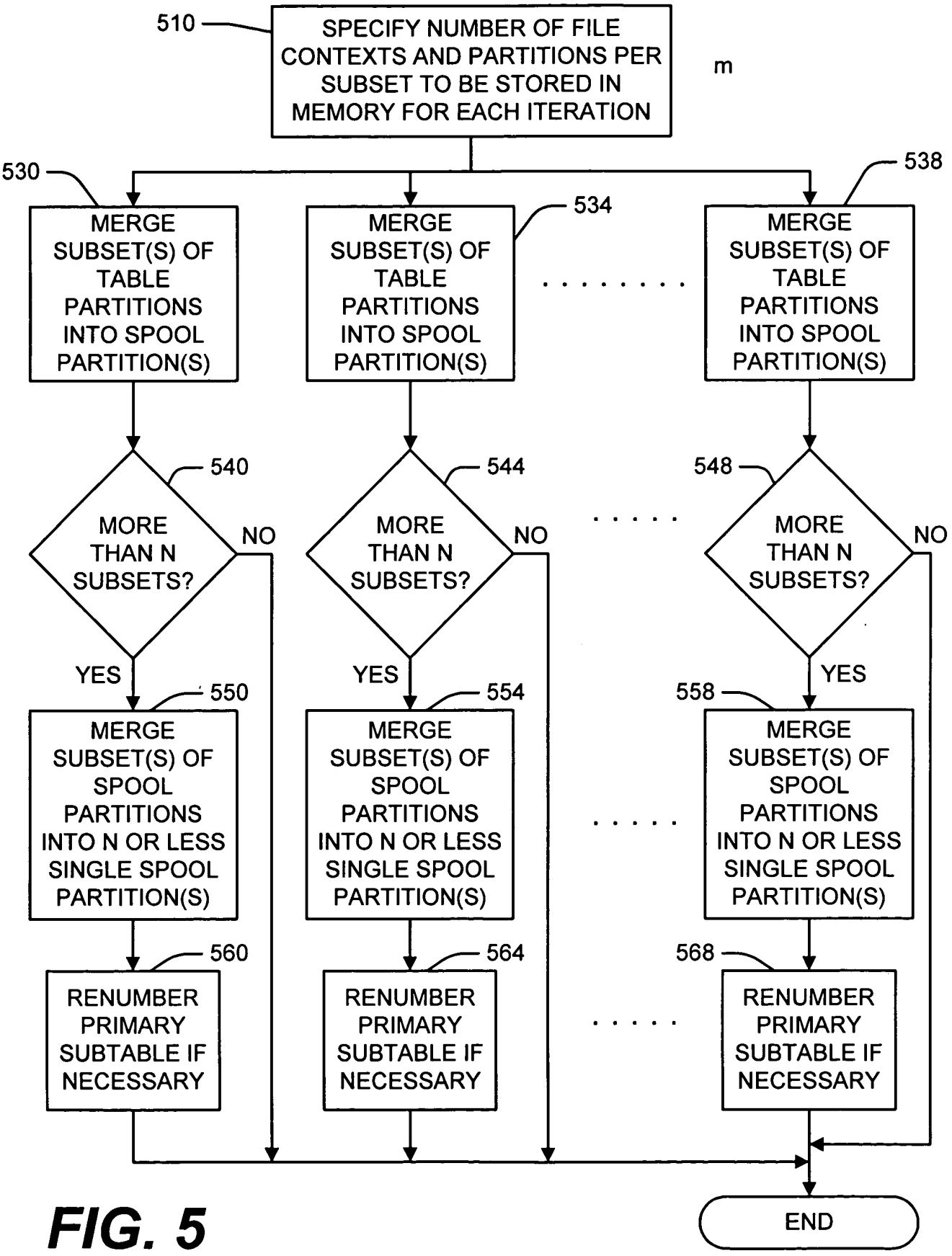
510
SPECIFY NUMBER OF FILE CONTEXTS AND PARTITIONS PER SUBSET TO BE STORED IN MEMORY FOR EACH ITERATION
m
530
MERGE SUBSET(S) OF TABLE PARTITIONS INTO SPOOL PARTITION(S)
534
MERGE SUBSET(S) OF TABLE PARTITIONS INTO SPOOL PARTITION(S)
538
MERGE SUBSET(S) OF TABLE PARTITIONS INTO SPOOL PARTITION(S)
540
MORE THAN N SUBSETS?
NO
YES
544
MORE THAN N SUBSETS?
NO
YES
548
MORE THAN N SUBSETS?
NO
YES
550
MERGE SUBSET(S) OF SPOOL PARTITIONS INTO N OR LESS SINGLE SPOOL PARTITION(S)
554
MERGE SUBSET(S) OF SPOOL PARTITIONS INTO N OR LESS SINGLE SPOOL PARTITION(S)
558
MERGE SUBSET(S) OF SPOOL PARTITIONS INTO N OR LESS SINGLE SPOOL PARTITION(S)
560
RENUMBER PRIMARY SUBTABLE IF NECESSARY
564
RENUMBER PRIMARY SUBTABLE IF NECESSARY
568
RENUMBER PRIMARY SUBTABLE IF NECESSARY
END

FIG. 5

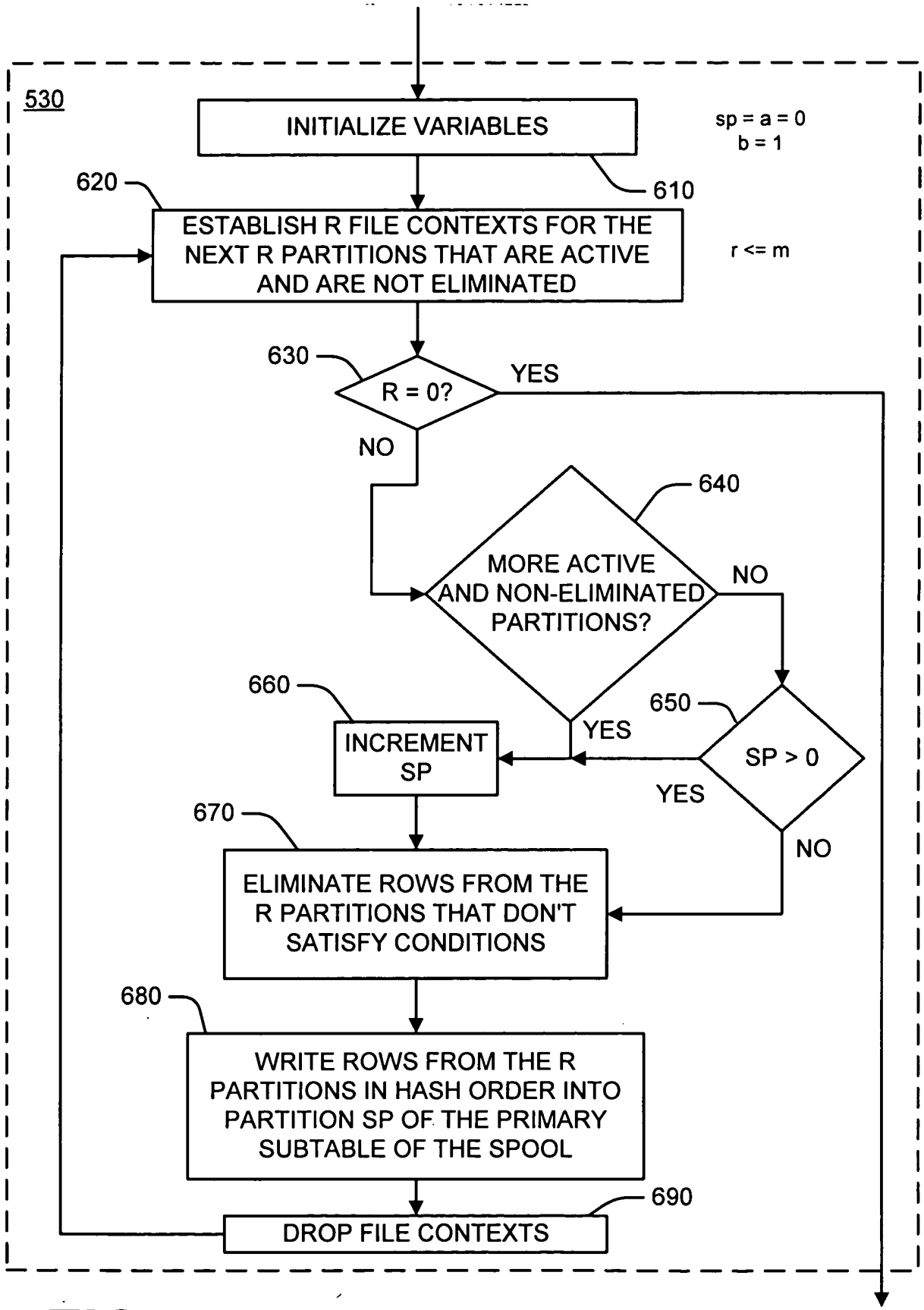
530
INITIALIZE VARIABLES
sp = a = 0
b = 1
610
620
ESTABLISH R FILE CONTEXTS FOR THE NEXT R PARTITIONS THAT ARE ACTIVE AND ARE NOT ELIMINATED
r <= m
630
R = 0?
YES
NO
640
MORE ACTIVE AND NON-ELIMINATED PARTITIONS?
NO
YES
650
SP > 0
YES
NO
660
INCREMENT SP
670
ELIMINATE ROWS FROM THE R PARTITIONS THAT DON'T SATISFY CONDITIONS
680
WRITE ROWS FROM THE R PARTITIONS IN HASH ORDER INTO PARTITION SP OF THE PRIMARY SUBTABLE OF THE SPOOL
690
DROP FILE CONTEXTS

FIG. 6

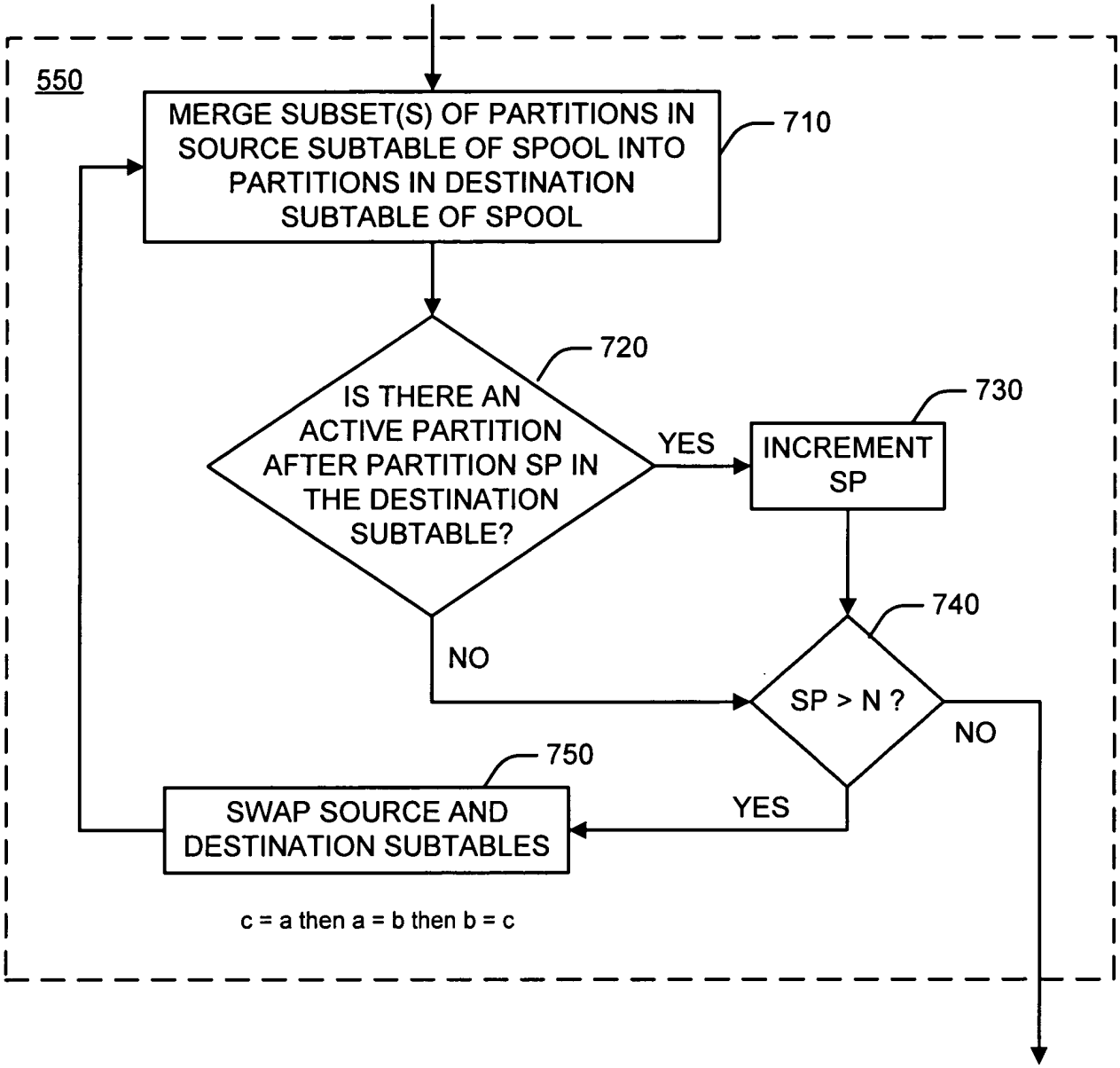
550
MERGE SUBSET(S) OF PARTITIONS IN SOURCE SUBTABLE OF SPOOL INTO PARTITIONS IN DESTINATION SUBTABLE OF SPOOL
710
IS THERE AN ACTIVE PARTITION AFTER PARTITION SP IN THE DESTINATION SUBTABLE?
720
YES
INCREMENT SP
730
NO
SP > N ?
740
NO
YES
SWAP SOURCE AND DESTINATION SUBTABLES
750
c = a then a = b then b = c

FIG. 7

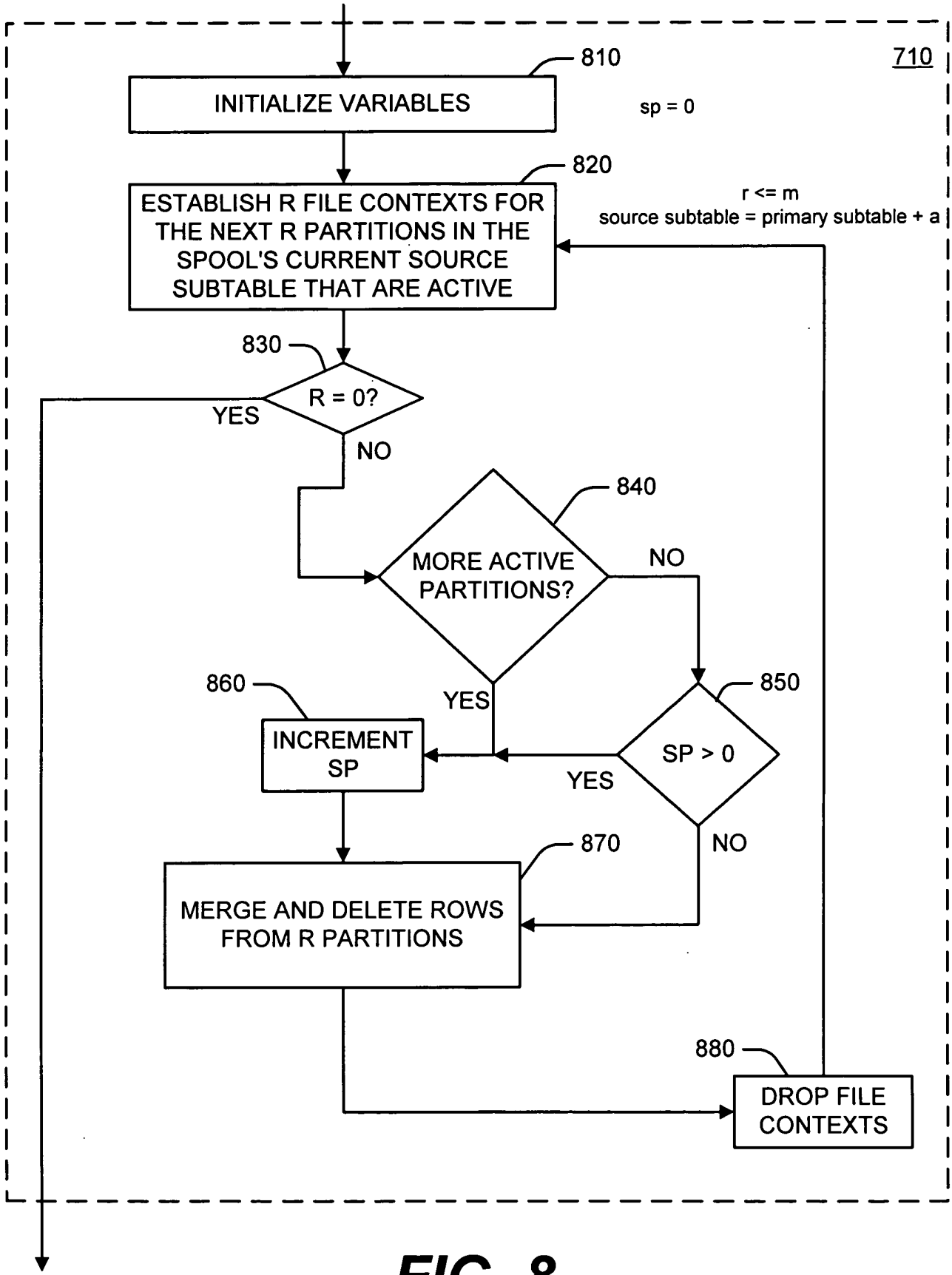
710
810
INITIALIZE VARIABLES
sp = 0
820
ESTABLISH R FILE CONTEXTS FOR THE NEXT R PARTITIONS IN THE SPOOL'S CURRENT SOURCE SUBTABLE THAT ARE ACTIVE
r <= m
source subtable = primary subtable + a
830
R = 0?
YES
NO
840
MORE ACTIVE PARTITIONS?
NO
YES
860
INCREMENT SP
850
SP > 0
YES
NO
870
MERGE AND DELETE ROWS FROM R PARTITIONS
880
DROP FILE CONTEXTS

FIG. 8

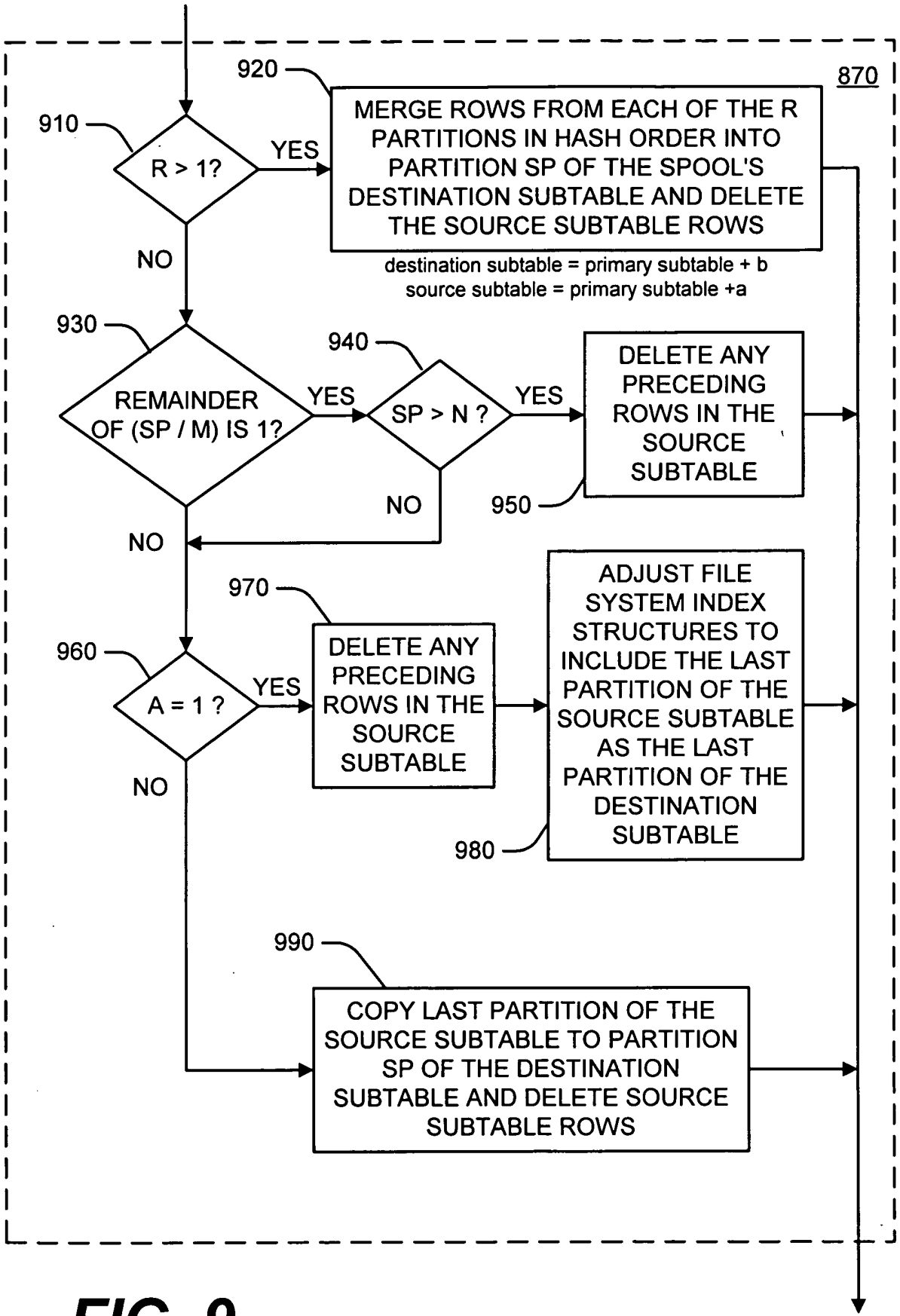
870
910
R > 1?
YES
920
MERGE ROWS FROM EACH OF THE R PARTITIONS IN HASH ORDER INTO PARTITION SP OF THE SPOOL'S DESTINATION SUBTABLE AND DELETE THE SOURCE SUBTABLE ROWS
destination subtable = primary subtable + b
source subtable = primary subtable +a
NO
930
REMAINDER OF (SP / M) IS 1?
YES
940
SP > N ?
YES
DELETE ANY PRECEDING ROWS IN THE SOURCE SUBTABLE
950
NO
NO
960
A = 1 ?
YES
970
DELETE ANY PRECEDING ROWS IN THE SOURCE SUBTABLE
ADJUST FILE SYSTEM INDEX STRUCTURES TO INCLUDE THE LAST PARTITION OF THE SOURCE SUBTABLE AS THE LAST PARTITION OF THE DESTINATION SUBTABLE
980
NO
990
COPY LAST PARTITION OF THE SOURCE SUBTABLE TO PARTITION SP OF THE DESTINATION SUBTABLE AND DELETE SOURCE SUBTABLE ROWS

FIG. 9

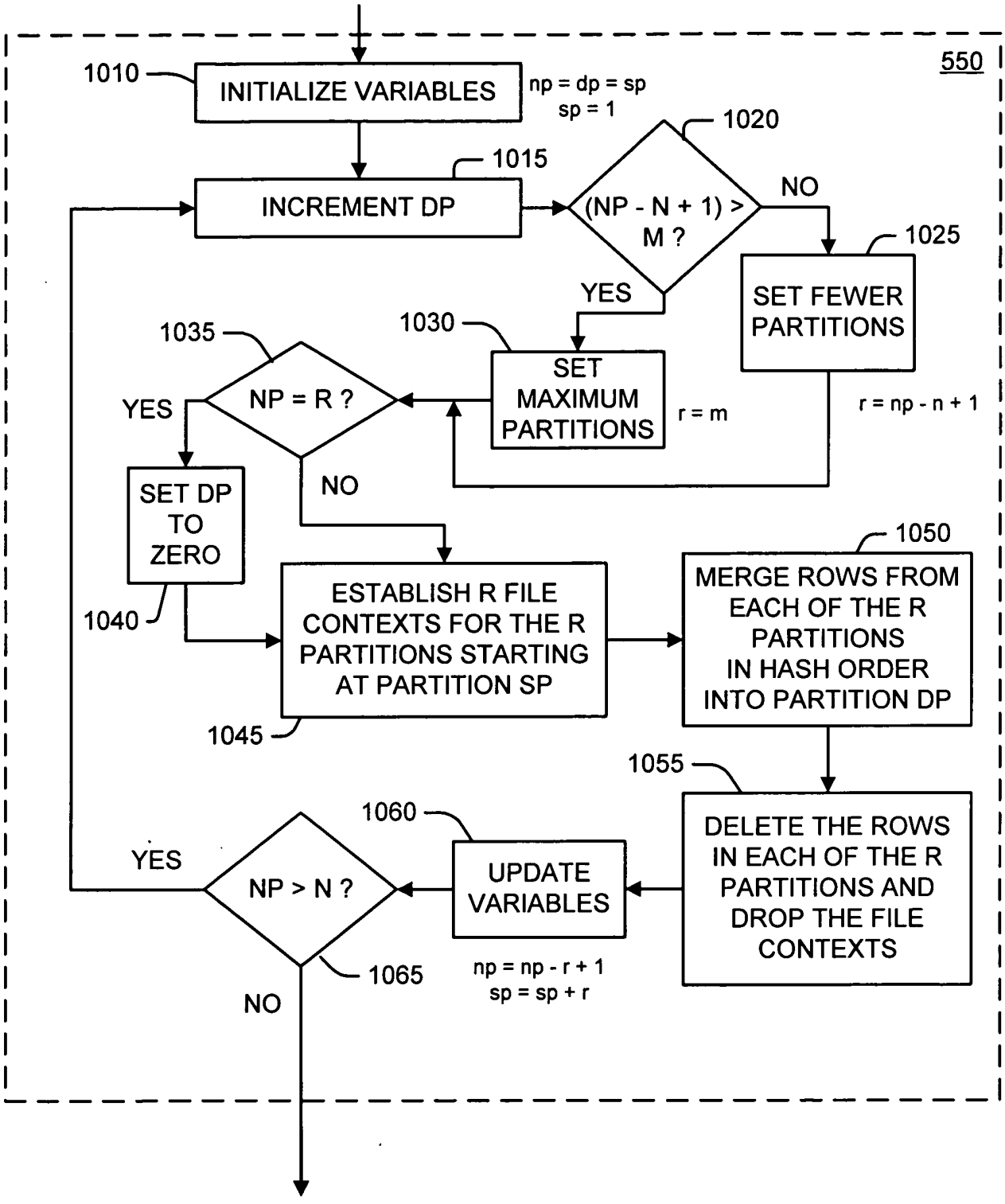
550
1010
INITIALIZE VARIABLES
np = dp = sp
sp = 1
1015
INCREMENT DP
1020
(NP - N + 1) > M ?
NO
1025
SET FEWER PARTITIONS
r = np - n + 1
YES
1030
SET MAXIMUM PARTITIONS
r = m
1035
NP = R ?
YES
NO
SET DP TO ZERO
1040
ESTABLISH R FILE CONTEXTS FOR THE R PARTITIONS STARTING AT PARTITION SP
1045
1050
MERGE ROWS FROM EACH OF THE R PARTITIONS IN HASH ORDER INTO PARTITION DP
1055
DELETE THE ROWS IN EACH OF THE R PARTITIONS AND DROP THE FILE CONTEXTS
1060
UPDATE VARIABLES
np = np - r + 1
sp = sp + r
1065
NP > N ?
YES
NO

FIG. 10

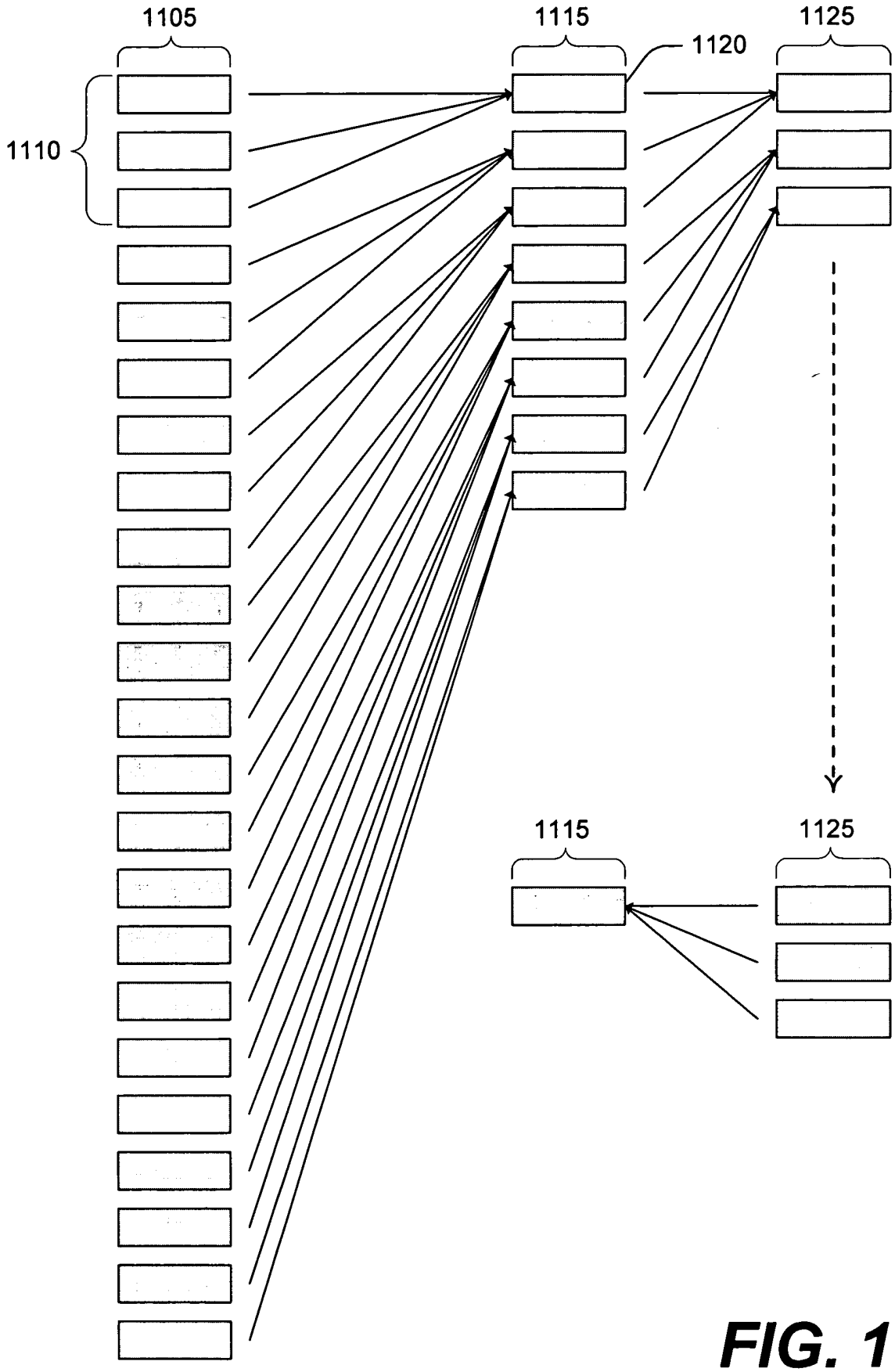

FIG. 11

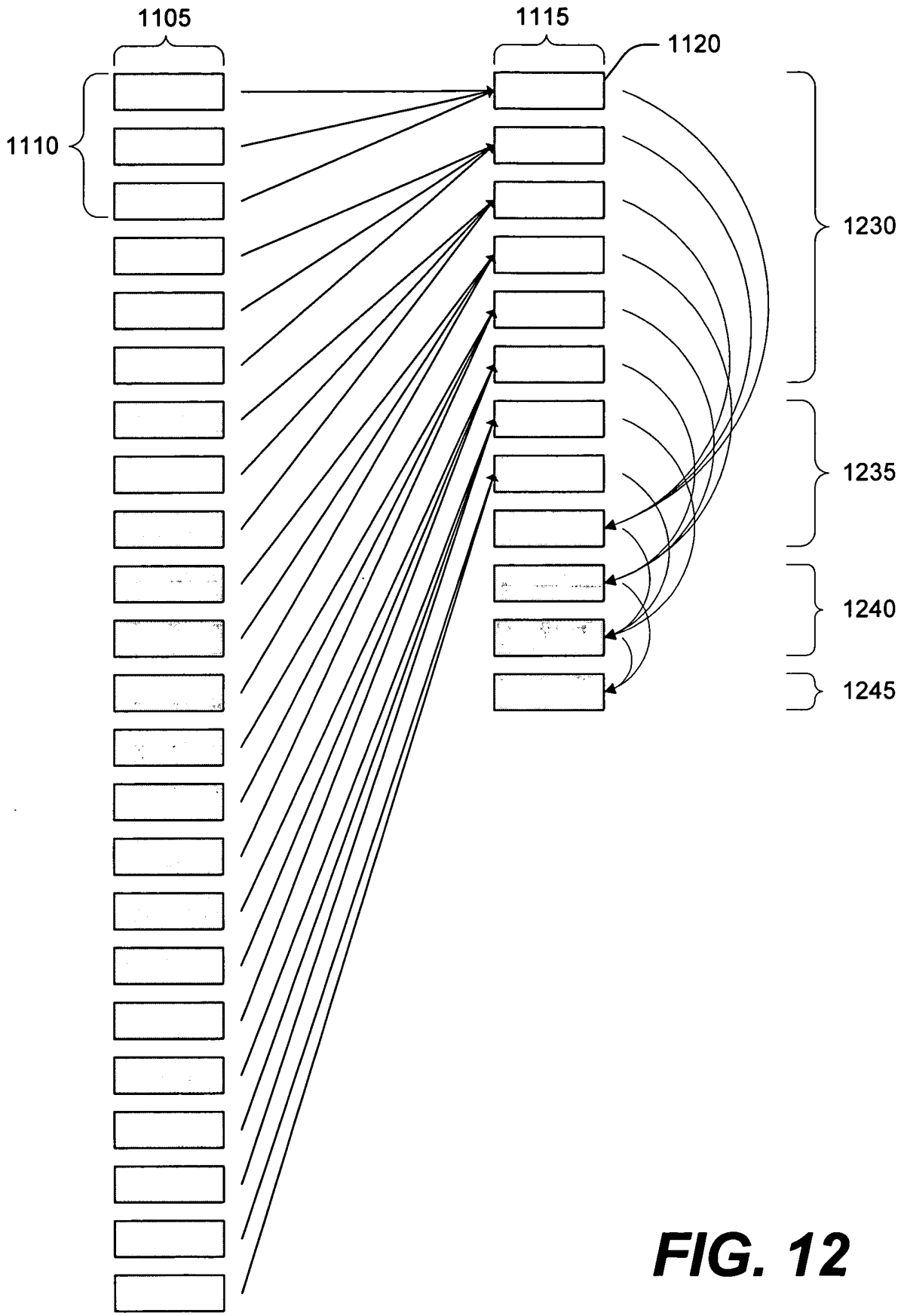

FIG. 12